

Metrics in Large-Scale Agile Software Development: A Multivocal Literature Review - Methodology

Renato Menezes, Marcelo Marinho, Suzana Sampaio

1. Research Topic

As large-scale projects increasingly adopt agile practices, the need for metrics arises to coordinate teams, promote continuous improvements, and monitor progress. In this study, I aim to understand and provide a comprehensive overview of metrics in agile development within scalable environments, offering valuable insights to the community.

2. Research Questions

(RQ1) What metrics are used in large-scale agile software development?

(RQ2) What are the reasons and outcomes of using metrics in large-scale agile development?

3. Multivocal Review Inclusion and Exclusion Criteria

We included: (i) literature that explicitly discusses the use of metrics related to large-scale agile projects, solutions, or adaptations of metrics in this scenario; (ii) conference papers, journals and official pages about metrics of the related frameworks; (iii) literature published after 2001; (iv) first 10 pages of the Google search. We excluded: (i) inaccessible literature; (ii) results that Google search considers similar to other results; (iii) Google ads; (iv) articles and pages in a language other than English.

4. Academic Literature Search String

(Metric) AND (SAFe OR “Scaled agile framework” OR LeSS OR “Large scale scrum” OR “Scrum-at-Scale” OR “Scrum@Scale” OR DA OR “Disciplined agile” OR Spotify OR Scrum OR “Scaling agile” OR Nexus) AND (“Large-scale” OR Large OR Scaled)

Filters:

January 2001 to December 2022; Journals and Conferences; English, Computer Science and Software Engineering Articles, Exclusion of Secondary Studies from Search.

Databases: IEEE, ACM, ScienceDirect, SpringerLink, Scopus

5. Evidence of the results found in each database

IEEE:

The screenshot shows the IEEE Xplore search results page. The search query is: **(Metric) AND (SAFE OR "Scaled agile framework" OR LeSS OR "Large scale scrum" OR "Scrum-at-scale" OR "Scrum@Scale" OR DAD OR "Disciplined agile delivery" OR Spotify OR Scrum OR "Scaling agile" OR Nexus) AND ("Large-scale" OR Large OR Scaled)**. The results are filtered by Conferences, Journals, and the year range 2001-2022. Two results are shown:

- Enterprise Scrum: Scaling Scrum to the Executive Level** by Daniel R. Greening, 2010 43rd Hawaii International Conference on System Sciences. Cited by: Papers (8).
- Agile-scrum Software Development Monitoring System** by Muhammad Bambang Firdaus, Ita Merni Patuliak, Andi Tejawati, Aslam Bryantama, Gubtha Mahendra Putra, Herman Santoso Pakpahan, 2019 International Conference on Electrical, Electronics and Information Engineering (ICEEIE).

ACM:

The screenshot shows the ACM Digital Library search results page. The search query is: **[Abstract: metric] AND [(Abstract: safe) OR (Abstract: "scaled agile framework") OR (Abstract: less) OR (Abstract: "large scale scrum") OR (Abstract: "scrum-at-scale") OR (Abstract: "scrum@scale") OR (Abstract: dad) OR (Abstract: "disciplined agile delivery") OR (Abstract: spotify) OR (Abstract: scrum) OR (Abstract: "scaling agile") OR (Abstract: nexus)] AND [(Abstract: "large-scale") OR (Abstract: large) OR (Abstract: scaled)] AND [Publication Date: (01/01/2001 TO 12/31/2022)]**. The results are filtered by Journals and the year range 2001-2022. One result is shown:

- Learning image-to-class distance metric for image classification** by Zhenxiang Wang, Yiqun Hu, Liang-Tien Chia. ACM Transactions on Intelligent Systems and Technology (TIST), Volume 4, Issue 2 • March 2013, Article No.: 34, pp 1-22 • <https://doi.org/10.1145/2438653.2438669>

ACM DIGITAL LIBRARY Association for Computing Machinery

Browse About

Journals Magazines Proceedings Books SIGs Conferences People Search ACM Digital Library

Search Results

Search Advanced Search

Applied Filters

Proceedings

2001 - 2022

Clear All

People

Names

Institutions

Authors

Reviewers

253 Results for: [Abstract: metric] AND ([Abstract: safe] OR [Abstract: "scaled agile framework"] OR [Abstract: less] OR [Abstract: "large scale scrum"] OR [Abstract: "scrum-at-scale"] OR [Abstract: "scrum@scale"] OR [Abstract: dad] OR [Abstract: "disciplined agile delivery"] OR [Abstract: spotify] OR [Abstract: scrum] OR [Abstract: "scaling agile"] OR [Abstract: nexus]) AND ([Abstract: "large-scale"] OR [Abstract: large] OR [Abstract: scaled]) AND [Publication Date: (01/01/2001 TO 12/31/2022)]

Searched The ACM Full-Text Collection (663,224 records) | Expand your search to The ACM Guide to Computing Literature (3,297,972 records)

RESULTS VIDEOS PEOPLE Showing 1 - 20 of 253 Results

Select All per page: 10 20 50 Relevance

RESEARCH-ARTICLE Evaluation on perceived sizes using large-scale augmented floor visualization devices
June 2019
Michael Otto, Eva Lampen, Philipp Agethen, Mareike Langohr, Gerald Masan, ...

ScienceDirect:

ScienceDirect Journals & Books Register Sign in You have institutional access

Find articles with these terms

(Metric) AND ("Scaled agile framework" OR "Scaling agile framework") ANI

Year: 2001-2022 X

Advanced search

18 results sorted by relevance | date

Download 18 articles Export

Research article Open access

1 Do scaling agile frameworks address global software development risks? An empirical study
Journal of Systems and Software, 16 September 2020, ...
Sarah Beecham, Tony Clear, ... John Noll
Download PDF Abstract Export

Research article Full text access

2 Quality requirements challenges in the context of large-scale distributed agile: An empirical study
Information and Software Technology, 14 February 2019, ...
Wasim Alsaqaf, Maya Daneva, Roel Wieringa

SpringerLink:

SpringerLink Sign up / Log in English Academic edition

(Metric) AND (SAFE OR "Scaled agile frame" New Search

Home Books A-Z Journals A-Z Videos Librarians

Visit Nature news for the latest coverage and read Springer Nature's statement on the Ukraine conflict

184 Result(s) for '(Metric) AND (SAFE OR "Scaled agile framework" OR LeSS OR "Large scale scrum" OR "Scrum-at-Scale" OR "Scrum@Scale" OR DAD OR "Disciplined agile delivery" OR Spotify OR Scrum OR "Scaling agile" OR Nexus) AND ("Large-scale" OR Large OR Scaled)'

within English Computer Science Software Engineering Management of Computing and Information Systems Conference Paper 2001 - 2022

Sort By Relevance Newest First Oldest First Date Published Page 1 of 10

Show documents published 2001 - 2022 Start year End year (Available 2002 - 2022) between 2001 and 2022 Submit

Chapter and Conference Paper

Orchestrating Agile IT Quality Management for Complex Solution Development Through Topic-Specific Partnerships in Large Enterprises - An Example on the EFIS Framework

A sua instituição tem acesso aos periódicos da Springer através do Portal da CAPES

Scopus:

6. Selection of Academic Literature

The 'Start' software was used as a tool in this article selection stage. 3479 articles were returned from the automatic search. After removing 393 duplicate articles, there are 3086 articles remaining to be classified, and no articles were left from the ScienceDirect database as they were all duplicates.

	IEEE	ACM	ScienceDirect	SpringerLink	Scopus	Total
Automatic Search	995	306	18	184	1976	3479
After removing duplicates	974	285	0	184	1643	3086

- 1st selection stage: reading the title and abstract of the 3086 articles.

	IEEE	ACM	ScienceDirect	SpringerLink	Scopus	Total
Accepted after the 1st selection stage	13	1	0	25	20	59

- 2nd selection stage: reading the introduction and conclusion of the 59 articles.

	IEEE	ACM	ScienceDirect	SpringerLink	Scopus	Total
Accepted after the 2nd selection stage	5	1	0	14	5	25

- Complete reading of the 25 articles

	IEEE	ACM	ScienceDirect	SpringerLink	Scopus	Total
• Analysis and evaluation	3	0	0	7	4	14

7. Grey Literature Search String

(Metric) AND (SAFe OR "Scaled agile framework" OR LeSS OR "Large scale scrum" OR "Scrum-at-Scale" OR "Scrum@Scale" OR DA OR "Disciplined agile" OR Spotify OR Scrum OR "Scaling agile" OR Nexus) AND ("Large-scale" OR Large OR Scaled)

Database: Google search. **Date of the search:** January 2023

8. Selection Strategy to Grey Literature

The official websites of metrics from all frameworks in the string were separated from the search results to ensure inclusion in the selection. In addition to these sites, the first 10 links returned from the search with the string were considered. Google ads were ignored from the search results. From all these (official sites + 10 first links), 2 cycles of forward snowballing were performed in the selection process of findings.

Search mechanism	Initial results	Reading titles and metatexts	Reading full texts
Google	13	13	5

9. Overview of the Multivocal Literature Review Methodology

